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## Data Validation Report, Fourth Quarter, Groundwater Chemical Analysis, 1100-EM-1 Operable Unit Phase I Remedial Investigation

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## 1. INTRODUCTION

This report presents the results of data validation and review conducted on 25 water samples collected as part of the 1100-EM-1 Phase I Remedial Investigation ground-water monitoring program. The samples were collected during the time period beginning November 26, 1990 and extending to December 6, 1990. Sample locations, identification and dates of sampling are presented in Table 1-1. The samples were collected by Westinghouse Hanford Co. personnel and following collection were released to a representative of Golder Associates Inc. for shipment to the analytical laboratory. All the samples were analyzed by Pacific Northwest Environmental Laboratory Inc., Mid-Pacific Environmental Laboratory Inc. and Gulf South Environmental Laboratory Inc.. The laboratory data package as received was complete and contained all the required deliverables as specified in the applicable contract requirements. Laboratory data was received at Golder Associates Inc. Redmond, Washington office on January 14, 1991. A summary of the valid results is provided in Section 8.

Data reporting qualifiers as recommended by the EPA data validation guidelines (Bleyler, 1988 and EPA 1989) were assigned during validation. The following data reporting qualifiers are used in this report:

- J - Indicates the value reported is an estimated value and may not reflect the actual amount present in the sample. The data should be considered useful for the decision-making process.
- U - Indicates the compound or analyte was analyzed for but not detected. The value reported is the sample quantitation limit. The data should be considered useful for the decision-making process.
- UJ - Indicates the compound or analyte was analyzed for but not detected. The value reported is the estimated sample quantitaion limit.
- R - Indicates the associated data are unusable. The compound was analyzed for but the presence or absence has not been confirmed.

### 1.1 Organization of Report

This report is presented in two volumes. Volume I contains Sections 1 through 9 of the validation report narrative and Volume II contains the appendices. Sections 2 through 5 present the data review of all the organic analyses. Section 6 presents the review of the inorganic data while Section 7 presents the review of the general chemistry analyses. Finally, sections 8 and 9 present respectively, a summary of the validation results and a list of references used during the validation. In addition, copies of the laboratory report forms and QC summary sheets are provided in the Appendices.

## 2. VOLATILE ORGANIC ANALYSES

A total of 48 samples were submitted between November 28, 1990 through December 6, 1990 for volatile organic analyses. Twelve of the samples were placed on hold by request of Golder Associates Inc. since they were trip blank samples and contained air bubbles upon receipt however, at least one trip blank from each sample receiving group was analyzed for volatile organics.

### 2.1 Holding Times

Of the 36 samples analyzed at the laboratory, all were analyzed within 10 days after collection. The required holding time was 14 days for acid preserved samples and all the samples were preserved properly. Samples were shipped cooled to 4°C and upon receipt were placed in refrigerated storage until the time of analysis. Anomalies that were noted on receipt of the volatile organic samples included air bubbles present in some of the vials. Golder was notified of these anomalies upon receipt and the following action was taken:

- If the sample was a trip blank and air bubbles were present in both vials, the sample was placed on hold.
- If the sample was from a monitoring well and air bubbles were present in both vials, the samples were processed as is. If only one vial contained air bubbles the vial without air bubbles was processed.

### 2.2 Instrument Calibration and Tuning

#### 2.2.1 GC/MS Tuning

A GC/MS tune report was present for each 12 h analytical period and the reported values were reviewed against the corresponding mass spectral lists. Analysis of the instrument performance check solution (BFB) met the ion abundance criteria for all tunes. Calculations of the critical ion abundances were checked and found to be properly calculated and reported.

#### 2.2.2 Initial Calibration

Initial calibration reports were provided and reviewed. The relative response factors (RRF) and relative standard deviations (RSD) reported for the target compounds (TCL) were recalculated and compared to the reported values and no transcription or calculation errors were noted. The calibration factors were within the limits specified in the statement of work, (EPA 1988a).

### 2.2.3 Continuing Calibration Data

Continuing calibration reports were present for each 12 hour analytical period in which samples were analyzed. The RRF and percent difference values (%D) were recalculated and no calculation errors were noted. All the RRF values met the criteria ( $>0.05$ ) as specified in the statement of work. All the reported %D values were within specification ( $<30\%$ ) with the exception of the compounds listed in Table 2-1. No data requalification is necessary based on the compounds that failed the criteria since no detected values were reported for the respective compounds.

### 2.3 Blanks

Laboratory method blanks, equipment blanks and trip blanks were submitted as a measurement of potential contamination introduced into the samples from the laboratory and sampling procedures. The following sections present summaries of the results of both the laboratory and field blanks.

#### 2.3.1 Laboratory Blanks

Method blanks were analyzed during each daily analysis run. There were no contaminants detected in the laboratory blanks. The report forms and raw data for all blanks were reviewed for unreported contaminants. Carbon dioxide was detected in some of the blanks and the spectra were submitted and correctly identified ( $m/z$  44) in the chromatograms. The compound is most likely due to a leak in the GC/MS system.

#### 2.3.2 Field Blanks

Fifteen field blanks were analyzed for volatile organic compounds and of these samples, 13 were trip blanks and two were equipment blanks. Table 2-2 presents a summary of the detected compounds in the blanks and the samples. Data validation guidelines specify that compounds detected at less than 5 times the amount in the field blanks should not be reported. Based on this requirement, any TCL present in the samples at less than 5 times the amount in any field blank was requalified as a non-detect in accordance with the data validation blank review requirements. Section 8 presents a summary of the data requalification necessary due to field blank results.

### 2.4 Accuracy

Accuracy of the volatile organic analyses was monitored by the addition of surrogate compounds in all samples, standards and blanks and by the analysis of matrix spike samples. The results of the accuracy monitoring analyses are presented in the following sections.

#### 2.4.1 Surrogate Recovery

Surrogates were added to all samples and blanks and the results were reported properly. In a review of the raw data versus the reported results no transcription or calculation errors were noted. All volatile organic surrogates were within specification and copies of the laboratory reported surrogate recoveries are provided in Appendix B.

#### 2.4.2 Matrix Spike Recovery

Matrix spikes and matrix spike duplicates were performed on two water samples within this sample analysis case. The laboratory reported the results on the proper forms and in a review of the reported results against the raw data no calculation errors were noted. All matrix spike compounds were within specification and copies of the report forms are provided in Appendix B.

### 2.5 Precision

Precision of the volatile organic analyses was monitored by the submittal and analysis of field duplicates and the analysis of matrix spike duplicates. The following sections provide a narrative summary of the precision evaluations.

#### 2.5.1 Matrix Spike/Matrix Spike Duplicates

As described in section 2.4.2, matrix spikes and matrix spike duplicates were performed on two water samples within this analysis case. All precision measurements (calculated as relative percent difference) were within specification and copies of the report forms are provided in Appendix B.

#### 2.5.2 Field Duplicates

Two sets of field duplicates were submitted for analysis. The samples were identified as BOOD27, BOOD31, BOOD66 and BOOD70. 1,1,1-Trichloroethane was the only compound detected in one of the samples, (BOOD31). No other compounds were detected so insufficient information is available for the assessment of precision of the volatile organic analyses based on field duplicate sample analyses.

### 2.6 System Performance

An assessment of analytical system performance was made by a review of internal standards data and chromatographic performance. A review of the chromatograms shows that carbon dioxide is present in the GC/MS system at low concentrations and this is

probably due to a leak in the purge and trap system. The retention time of CO<sub>2</sub> (2.0 min.) does not interfere with the detected compounds in the samples.

### 2.6.1 Internal Standards Performance

Internal standards were added to all samples, standards and blanks. The results were reviewed against the raw data and no transcription errors were noted. All area values and retention times were within specification and copies of the internal standard reports are provided in Appendix B.

### 2.7 Compound Quantitation and Identification

In a review of the quantitation lists and mass spectra, a retention time shift between the reported compounds and the associated continuing calibration standards was noted that exceeded the  $\pm 0.06$  requirement. Mass spectral data were reviewed for these reported compounds and spectral matches were acceptable so no data requalification is necessary due to the retention time shifts.

In addition, sample result quantitation and contract required quantitation limits (CRQLs) were recalculated and no discrepancies were noted.

#### 2.7.1 Tentatively Identified Compounds (TICs)

The raw data were reviewed to verify the laboratory had conducted a mass spectral library search for all required peaks seen in the chromatograms for samples and blanks. One TIC was reported as an unknown in sample BOOD64 at 16.04 minutes at a concentration of 5.0 J ug/L and in sample BOODH3 (trip blank) at 20.89 minutes at a concentration of 9.0 J ug/L.

### 2.8 Overall Assessment

The data as received from the laboratory was complete and analyses were conducted in accordance with the statement of work. No quality control deficiencies were identified that affect the usability of the data. A summary of the data requalifications necessary is provided in Section 8.

### 3. SEMI-VOLATILE ORGANIC ANALYSES

A total of 25 water samples were collected and submitted for semivolatile organic analysis by the contract laboratory. Copies of the laboratory reports and QC summary sheets are provided in Appendix C. The following sections summarize the data validation review conducted.

#### 3.1 Holding Times

All samples were extracted within 7 days of collection and analyzed within 40 days of extraction as required by the statement of work.

#### 3.2 Instrument Tuning and Calibrations

This section summarizes the review of the instrument tuning, initial calibration and continuing calibrations conducted by the laboratory.

##### 3.2.1 GC/MS Tuning

A GC/MS tuning report was present for each 12 h analytical period and the reported values were properly reported from the mass calibration reports. All calibration mass abundances were within specification and no calculation or transcription errors were noted.

##### 3.2.2 Initial Calibration

The initial calibration data was properly reported and upon review all RRF and RSD values were within specification and no calculation or transcription errors were noted. Review of the raw chromatograms shows a large peak present between 5 and 6 minutes in every standard, but, since the earliest eluting semivolatile compound is 7.45 minutes, this large contaminant peak does not interfere with the target compound quantitation.

##### 3.2.3 Continuing Calibrations

Continuing calibrations were performed for every 12 h analytical period and RRF and %D values were within specification with the exception of the compounds summarized in Table 3-1. All the compounds exceeding the calibration criteria are listed as compounds that respond erratically, exhibit poor linearity and sensitivity and have no minimum RRF or maximum %D criteria, (EPA, 1989), with the exception of hexachlorocyclopentadiene and 2,4,6-tribromophenol. Since no positive results were reported for hexachlorocyclopentadiene and 2,4,6-tribromophenol is a surrogate and percent recovery is monitored for this compound no data requalification is necessary based on continuing calibrations.

There is an unknown peak present in all the continuing calibrations eluting between 5 and 6 minutes and appears to be a contaminant. The retention time of this compound does not interfere with the TCL compound calibration.

### 3.3 Blanks

Section 3.3.1 presents a summary of the field blanks analyzed for this sample group and Section 3.3.2 provides a summary of the laboratory blank analyses and the data requalifications required.

#### 3.3.1 Field Blanks

Two equipment blanks and two trip blanks were submitted for semivolatile analysis. Bis(2-ethylhexyl)phthalate (BEHP) was detected in one equipment blank at a concentration of 5 ug/L. Though BEHP is a common laboratory contaminant, it was not detected in any of the associated laboratory or trip blanks and is therefore considered valid. Several TICs were detected in the samples and Table 3-2 summarizes semivolatile compounds detected in all blanks and samples. Toluene, acetic acid (ethyl ester) and the unknown hydrocarbons detected will be eliminated from further consideration since they were detected in the associated laboratory and field blanks. Diacetone alcohol will be eliminated from consideration since it is a common aldol condensation product of acetone and was detected in the associated laboratory blanks.

#### 3.3.2 Laboratory Blanks

Method blanks were reported for each extraction batch and the reported results were compared to the raw quantitation reports and mass spectral data. No target compounds were reported in the laboratory blanks, however, several TICs were detected as summarized in Table 3-2. A large unidentified peak was also present in the total ion chromatograms eluting between 5 and 6 minutes and this was also seen in the standards and samples.

### 3.4 Accuracy

Assessment of accuracy for the sample group was determined by a review of matrix spike recovery and surrogate recovery. Typically at least one set of matrix spikes is analyzed for the sample group and surrogate compounds are added to the samples prior to extraction to monitor compound extraction efficiency and system performance. Section 3.4.1 presents a summary of the surrogate recovery performance and section 3.4.2 discusses the results of the matrix spike analyses.

### 3.4.1 Surrogate Recovery

Surrogates were added to all samples, blanks and standards and the results were properly reported. The reported results were reviewed against the raw data and no calculation or transcription errors were noted. All surrogate recoveries were within the required quality control limits. Copies of the surrogate recovery results are provided in Appendix C.

### 3.4.2 Matrix Spike Recovery

Two sets of matrix spikes, sample BOOD04 (Location: MW-8) and BOOD54 (Location: 699-S29-E12) were analyzed by the laboratory and copies of the results are presented in Appendix C. The results were properly reported and no transcription or calculation errors were noted upon comparison to the raw data. Percent recoveries were acceptable with the exception of the result for 4-nitrophenol (4%) for sample BOOD04MS, however, no data requalification is necessary since 4-nitrophenol was not detected in any of the samples and this compound has been identified as one that exhibits poor linearity, response and sensitivity, (EPA 1989).

## 3.5 Precision

Precision for the sample group was monitored by the analysis of matrix spike, matrix spike duplicate (MS/MSD) and field duplicate samples. As discussed in Section 3.4, two matrix spike/matrix spike duplicate sets were analyzed with the sample group. In addition two field duplicate samples were collected and analyzed consisting of samples BOOD27 and BOOD31 (Location: MW10) and samples BOOD66 and BOOD70 (Location: 699-S38-E12B).

### 3.5.1 Matrix Spike/Matrix Spike Duplicates

Results for the MS/MSD were reported properly and upon review of the raw data against the reported results no transcription or calculation errors were noted. Precision criteria for 2,4-dinitrotoluene and pentachlorophenol were exceeded for the MS/MSD on sample BOOD04 and for 4-nitrophenol on sample BOOD54. For both sample sets the reported matrix spike concentrations varied widely for the compounds resulting in the high RPD values. No explanation could be offered by the laboratory and no data requalification is necessary based on the precision exceedances since no detected results were reported for the compounds. Copies of the MS/MSD reports are included in Appendix C.

### 3.5.2 Field Duplicates

Results of the field duplicates indicate only tentatively identified compounds were detected in the samples so no precision estimates can be made for target compounds.

### 3.6 System Performance

System performance was assessed by a review of the chromatographic instrument performance and the internal standards. The calibration standards, samples and blanks exhibit a large toluene peak (1000 to 1600 ug/L) between 5 and 6 minutes which is prior to the elution of the first TCL compound and therefore the identification and quantitation of the target compounds was not affected.

#### 3.6.1 Internal Standards Performance

Internal standards were reported properly and a review of the raw data against the reported results indicates no transcription errors. The area and retention time values were within specification and copies of the reports are provided in Appendix C.

### 3.7 Compound Quantitation and Identification

A review of the sample chromatograms indicates that no compounds were omitted from quantitation. Bis(2-ethylhexyl)phthalate was the only target compound identified in sample BOOD60 (trip blank) at a concentration of 5 J ug/L. The mass spectra for this compound were acceptable and no calculation errors were noted.

Quantitation limits were correctly reported and calculated according to the sample and extract volume. Response factors reported during the initial and continuing calibration were calculated properly based on the correct internal standard as specified in the statement of work.

#### 3.7.1 Tentatively Identified Compounds

The raw data were checked to verify the laboratory had generated a library search for all required peaks seen in the chromatograms for samples and blanks. Mass spectra for the TICs were reviewed and the proper identifications and qualifiers were reported. The TICs reported in the blanks were reviewed and corresponding samples with TIC values less than 5X were eliminated from consideration. Toluene was detected in samples as an unknown. The same levels were detected in the blanks and following the 5X criteria were eliminated from consideration. A TIC identified in the laboratory blank, SBLKDB, at 29.52 minutes was used to requalify samples 2797-04, 2797-10, 2803-01, and 2803-10 with BJ qualifiers and was therefore eliminated from the validated results table.

### 3.8 Overall Assessment

The data as received from the laboratory was complete and analyses were conducted in accordance with the statement of work. No quality control deficiencies were identified that affect the usability of the data. Since blanks, standards and samples contain the toluene it

is difficult to assess where the contamination originated. However, its presence in the standards would indicate that the problem is not due to the sample preparation. The re-qualifications for all semi-volatile samples are summarized in Table 8-1. The validated semi-volatile results are summarized in Table 8-2.

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#### 4. PESTICIDE/PCB DATA REVIEW

A total of 25 water samples were collected and submitted for organochlorine pesticides and PCB analysis by the contract laboratory. Copies of the laboratory report forms including the quality control analyses are provided in Appendix D. The following sections summarize the data validation review conducted.

##### 4.1 Holding Times

All the samples were extracted within the 7 days from the date of collection and analyzed within 40 days of extraction as required by the statement of work (EPA, 1988a). Samples were shipped properly with coolant in the shipping container and chain-of-custody was maintained from the time of collection to the time of receipt at the laboratory.

##### 4.2 Instrument Performance and Calibrations

The instrument performance data was properly reported and the 4,4'-DDT retention time data reviewed and compared to the reference standard. All DDT retention times were >12 minutes as required by the statement of work. Retention time windows were properly reported and all analyzed standards were within the proper time windows. Percent breakdown of endrin and DDT was less than 20% in all the evaluation standard mixtures and no transcription or calculation errors were noted. Surrogate retention times were reported properly and within the quality control limits and recalculation or the percent difference values were acceptable.

A review of the calibration information is provided in the following sections.

###### 4.2.1 Initial Calibration

The initial calibration summaries were properly reported, reviewed and verified against the raw data and no transcription or calculation errors were noted. The calibration response factors and percent relative standard deviation values were within specification.

###### 4.2.2 Continuing Calibrations

The continuing calibrations were conducted at the proper frequency and were properly reported. Calibration factors for each standard were within specification on both the quantitation and confirmation columns.

### 4.3 Blanks

Section 4.3.1 presents a summary of the field blank analyses conducted and section 4.3.2 provides a review of the laboratory blank analyses. Copies of the laboratory reports are provided in Appendix D.

#### 4.3.1 Field Blanks

Two equipment blanks and two trip blanks were submitted for this sample group. The results were properly reported and no target compounds were detected in any of the samples. In a review of the reported results against the raw data no compounds were missed in the quantitation or confirmation analysis of the samples.

#### 4.3.2 Laboratory Blanks

The laboratory extracted and analyzed a method blank with each extraction batch. The data was properly reported and no target compounds were detected in the blanks. In a review of the reported results against the raw data, no compounds were missed in the quantitation or confirmation analysis of the blanks.

### 4.4 Accuracy

An assessment of accuracy was conducted by review of surrogate and matrix spike recoveries. Section 4.4.1 presents a review of the surrogate recoveries and section 4.4.2 provides a review of the matrix spike analyses.

#### 4.4.1 Surrogate Recovery

The surrogate compound dibutylchloroendate was added to samples, standards and blanks. Analysis results were reported properly and a review of the reported results against the raw data indicates no transcription or calculation errors. All surrogate recoveries were within specification and copies of the surrogate summary forms are provided in Appendix D.

#### 4.4.2 Matrix Spike Recovery

Matrix spike recoveries were properly reported and all recoveries were within specification. In a review of the raw data versus the reported values no transcription or calculation errors were noted. Copies of the matrix spike recovery summaries are provided in Appendix D.

#### 4.5 Precision

Assessment of precision was made by the collection and submittal of field duplicate samples and by the laboratory analysis of matrix spikes and matrix spike duplicates. Two sets of field duplicate samples were submitted for analysis at the laboratory, one set identified as BOOD27 and BOOD31 collected from monitoring well MW-10 and one set identified as BOOD66 and BOOD70 collected from monitoring well 699-S38-E12. Two sets of matrix spike/matrix spike duplicates were also analyzed at the laboratory. Analysis results for all precision measurements are summarized below.

##### 4.5.1 Field Duplicates

No target compounds were detected in the field duplicate samples so no assessment of precision can be made from field duplicates.

##### 4.5.2 Matrix Spike/Matrix Spike Duplicates

Precision of the MS/MSD analyses were within specification. A review of the raw data against the reported values indicated no transcription or calculation errors. Copies of the MS/MSD reports are provided in Appendix D.

#### 4.6 TCL Compound Identification

No positive results were reported for pesticides so qualitative evaluation of retention time windows on dissimilar GC columns and GC/MS confirmation data review was not required.

#### 4.7 Compound Quantitation and Identification

All results were reported to the proper quantitation limits with the proper corrections for sample and extract volumes.

#### 4.8 Overall Assessment

All data reported for pesticides and PCBs met the contractual and statement of work requirements. Quality control data was acceptable and no requalifications were required based on the data validation review. Copies of the laboratory reports are provided in Appendix D.

## 5. HERBICIDES

A total of 24 samples were submitted to the laboratory for chlorinated herbicide analysis. Copies of the laboratory reported results are provided in Appendix E.

### 5.1 Holding Times

All samples were extracted within the required seven days and analysis was completed within 40 days of extraction.

### 5.2 Calibrations

Section 5.2.1 presents a summary of the initial calibration information, section 5.2.2 provides information related to the continuing calibrations performed.

#### 5.2.1 Initial Calibration

A four point initial calibration was run on the GC prior to sample analysis. The coefficient of variation for the calibration curve was  $>0.995$  for every initial calibration performed. The raw data was reviewed and no calculation or transcription errors were noted.

### 5.3 Continuing Calibration

Continuing calibration standards at the mid-range concentration were analyzed every 10 samples with the calculated concentrations within 22% of the initial calibration results. Chromatograms and external standard tables were reviewed and the data were properly reported.

### 5.4 Blanks

Field blanks were submitted consisting of one trip blank and two equipment blanks. In addition, a laboratory blank was extracted with each sample analysis batch.

#### 5.4.1 Field Blanks

The field blank samples were identified as follows: BOODK3 (trip blank) and samples BOODF5 and BOODG4 were equipment blanks. No herbicides were detected in the field blanks and upon a review of the raw data against the reported results no peaks were eliminated from quantitation.

#### 5.4.2 Laboratory Blanks

A total of five extraction blanks were reported with all results below the detection limit for the target compounds. The chromatograms were reviewed with no missed peaks identified.

#### 5.5 Accuracy

Accuracy was monitored during the analysis through the use of surrogates and matrix spike/matrix spike duplicates. Appendix E provides copies of the reported results with the surrogate results reported with each respective sample result. Matrix spike/matrix spike duplicate recoveries are reported on the last two pages of Appendix E.

##### 5.5.1 Surrogate Recovery

The surrogate used for analysis was 2,4-DB and was added to all samples, standards and blanks. Surrogate recoveries were considerably low for several samples and ranged from 2 to 70 percent recovery. Surrogate recovery limits applicable to the pesticide/PCB analyses were applied against the herbicide analyses since both analyses are conducted by gas chromatography with electron capture detection. Samples that exhibited recoveries below 10% were requalified as R or unusable. Samples that exhibited recoveries greater than 10% but less than 24% were requalified as UJ or with the sample quantitation limit estimated. Table 8-2 presents a summary of the data requalification required.

Conversations with the laboratory for an explanation as to the low surrogate recoveries indicates that since the analysis requires an estrification step prior to gas chromatography this is the likely source of the low surrogate recoveries. The method used by the laboratory is not a routine procedure for the laboratory and also may be the cause for the low surrogate recoveries.

##### 5.5.2 Matrix Spike/Matrix Spike Duplicate Recovery

Two sets of matrix spike and matrix spike duplicates were analyzed by the laboratory for this sample group. Copies of the results are provided in Appendix E. Percent recoveries for the MS/MSDs ranged from 6.3 to 66.8%. The laboratory provided a similar explanation as for the low surrogate recoveries. No data validation criteria are specified for MS/MSD recoveries and no requalification will be required as a results of the low recoveries.

#### 5.6 Precision

Precision was monitored by the collection and submittal of two sets of field duplicate samples and the analysis of matrix spike and matrix spike duplicates. Results of the field duplicate analysis are provided in section 5.7.1 and the matrix spike and matrix spike

duplicate analyses are discussed in section 5.7.2. Copies of the laboratory reports are provided in Appendix E.

#### 5.6.1 Field Duplicate Precision

The samples submitted as field duplicates were identified as BOOD27 and BOOD31 collected from monitoring well MW-10 and one set identified as BOOD66 and BOOD70 collected from monitoring well 699-S38-E12. No target compounds were detected in either sample set so no estimate of precision can be made from the analysis of field duplicates. A review of the raw data indicates that no candidate peaks were present that were omitted from quantitation.

#### 5.6.2 Matrix Spike and Matrix Spike Duplicate Precision

Two sets of MS/MSD analyses were conducted and the precision measured as relative percent difference was reported as 15.8 and 72 for the compound 2,4-D and 7.8 and 92.3 for 2,4,5-TP (Silvex). The estrification step again is the probable cause for the high relative percent difference.

#### 5.7 Compound Quantitation and Identification

There were no herbicide compounds detected in the samples and a review of the raw data shows no missed candidate peaks. CRQLs were properly calculated with the sample and extract volumes taken into consideration.

#### 5.8 Overall Assessment

All essential quality control requirements were met for the analysis with the exception of the surrogate recoveries on several samples and blanks. Sample data with surrogate recoveries less than 10% will be requalified as unusable (R); sample data with surrogate recoveries greater than or equal to 10% but less than 24% will be requalified as estimated (U).

## 6. CLP INORGANIC ANALYSIS DATA REVIEW

A total of 24 samples were analyzed for total and dissolved metals. Table 1-1 presents a tabular summary of the field sample designations, laboratory identifiers and sample locations. Copies of the laboratory reports are provided in Appendix F.

### 6.1 Holding Times

Sample preparation logs and chain-of-custody forms were reviewed for dates of sample collection and preparation. Mercury preparation and analysis was completed within 28 days from sample collection. Other metals were analyzed within 6 months of collection and the cyanide samples were analyzed within 14 days from sample collection.

### 6.2 Instrument Performance and Calibrations

Blanks and standards were analyzed at the proper frequency for ICP, AA, mercury (HG), and cyanide (CN) analyses for both total and dissolved metals. Correlation coefficients for all AA, HG and CN analyses were  $\geq 0.995$  as required by the statement of work (EPA, 1988b). The calibration summary reports were reviewed per type of analysis and the values were correctly reported and within the QC limits specified in the statement of work. A midrange standard for CN analysis was distilled as required in the method with the percent recovery within specification at 102%.

#### 6.2.1 ICP Interference Checks

ICP interference check samples were analyzed at the proper frequency and the results were properly reported. The reported results were reviewed against the raw data and no calculation or transcription errors were noted. Percent recoveries of the Solution AB analyses were within  $\pm 20\%$  of the true value.

### 6.3 Blanks

Four field blanks were submitted for total and dissolved metals analysis consisting of two equipment blanks and two trip blanks.

#### 6.3.1 Field Blanks

Low concentrations of calcium, iron, barium and magnesium were detected in the field blanks as summarized in Table 6-1. No data requalification was conducted based on the field blank results.

### 6.3.2 Laboratory Blanks

Laboratory blank summary reports were reviewed against the raw data and no anomalies were noted. Calcium, magnesium, sodium, potassium and zinc were detected in laboratory blanks for the total metals analyses. Aluminum, magnesium, potassium, sodium and zinc were detected in the preparation blank for the dissolved metals analyses. Sample results greater than the instrument detection limit but less than five times the amount in any blank were re-qualified as U or not detected. Table 6-2 presents a summary of the requalifications required. Beryllium was reported in the preparation blank at a negative concentration which was not used in the data requalification.

### 6.4 Accuracy

Assessment of accuracy was determined by the analysis of spikes and laboratory control samples. Section 6.4.1 and 6.4.2 present a discussions of the spike sample results and laboratory control sample results respectively. Copies of the laboratory reports are provided in Appendix F.

#### 6.4.1 Spike Sample Analysis

The spike sample results were reported properly and reviewed against the raw data and all results were calculated and reported correctly. Total metals results were within the 75 to 125% recovery limits. Dissolved selenium was reported outside the recovery limits. All dissolved metal results for selenium were less than the IDL requiring requalification of all dissolved selenium data as UJ or estimated.

#### 6.4.2 Laboratory Control Sample Analysis

Laboratory control samples were analyzed and the results were reviewed against the raw data and all results were properly reported. Results were recalculated and within the QC limits of 80 to 120 %R.

### 6.5 Precision

Precision was monitored by the analysis of field duplicates and laboratory duplicates. Section 6.5.1 and 6.5.2 present summaries of the field duplicate and laboratory duplicate analyses respectively.

#### 6.5.1 Field Duplicates

Two sets of field duplicates were submitted each for total and dissolved metals analysis. The samples were identified as BOOD27 and BOOD31 (Well MW-10, total metals), BOOD28

and BOOD32 (Well MW-10, diss. metals), BOOD66 and BOOD70 (Well 699-S38-E12B, total metals), and BOOD67 and BOOD71 (Well 699-S38-E12B, dissolved metals). Table 6-3 provides a summary of the field duplicate analyses for both total and dissolved metals. Relative percent differences were comparable with the laboratory duplicate specifications with the exception of one result for iron on samples BOOD27 and BOOD31 where the RPD was 93%.

### 6.5.2 Laboratory Duplicates

Laboratory duplicate results were reported properly and the RPD values were within specification for measurements greater than the IDL. Copies of the laboratory duplicate results are provided in Appendix F.

### 6.5.3 ICP Serial Dilution

Serial dilution results were reported properly and reviewed against the raw data and all results were calculated and reported correctly. The ten percent difference criteria were exceeded for iron, barium, magnesium, manganese, potassium and sodium. Only magnesium and sodium require requalification as estimated (J) because the results for other analytes were not sufficiently elevated above the IDL (50 X) to require requalification. Samples requalified for magnesium and sodium are summarized in Section 8.

### 6.6 Furnace Atomic Absorption QC

All raw furnace AA data was reviewed and duplicate injections for all results >CRDL exhibited RSDs within the  $\pm 20\%$  criteria. The analysis run logs and raw data were reviewed to determine if post-digest recoveries were within the  $\pm 15\%$  criteria. Post-digest recoveries for total metals were exceeded for arsenic, lead, thallium and selenium. Post-digest recoveries for dissolved metals were exceeded for arsenic, selenium, and thallium. Sample absorbance in all cases were <50% requiring all affected sample results to be requalified as estimated (J) or (UJ).

### 6.7 Analyte Quantitation

A review of the raw instrument printouts against the reported data indicates no transcription or calculation errors. Sample results were reported properly with the sample volumes and dilutions taken into account.

### 6.8 Overall Assessment

With the exception of minor re-qualification of some of the total and dissolved metals data no critical QC requirements were exceeded. The samples were analyzed in accordance with the statement of work and contractual requirements.

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## 7. WET CHEMISTRY ANALYSIS

### 7.1 Total Organic Carbon (TOC) and Total Organic Halides (TOX) Analysis

A total of 25 samples were submitted for TOC and TOX analysis. The TOC analysis was conducted at Mid-Pacific Environmental Laboratory Inc. of Mountain View, California and the TOX analysis was conducted at Gulf South Environmental Laboratory Inc. of New Orleans, Louisiana which are sister laboratories of PNELI. All samples were analyzed within the 28 day holding time. The reported results were reviewed against the raw data and the results were reported properly. Laboratory duplicates, spikes, blanks and calibration verification samples were analyzed with each sample batch and results were acceptable. Field duplicate samples were submitted and the results are summarized as follows.

Sample ID	BOOD27	BOOD31	RPD
TOC	26	23	12.24
TOX	0.071	0.13	-58.71
Sample ID	BOOD66	BOOD70	RPD
TOC	12	14	-15.38
TOX	0.102	0.100	1.98

Two equipment blanks and trip blanks were submitted for TOC and TOX analysis and the results are summarized below.

Sample ID	BOOD60	BOODF5	BOODG4	BOODK3
Sample type	Trip Blank	Equip. Blank	Equip. Blank	Trip Blank
TOC	<2.0	4.7	<2.0	<2.0
TOX	0.084	0.075	0.064	0.045

Since TOC and TOX were detected in at least one field blank, the highest field blank result was multiplied by 5 and compared to the sample results. Sample results less than this value were requalified as non-detects (U). As a result all TOX results will be requalified as non-detects. For TOC analyses all results below 23.5 ( $4.7 \times 5$ ) will be requalified as non-detects which affects samples BOOD23, BOOD31, BOOD62, BOOD54, BOOD58, BOOD66, BOOD70, BOOD74, BOOD78, BOOD82, BOODF5, and BOOD89.

## 7.2 General Chemistry Analysis

### 7.2.1 Holding Times

Holding Times were exceeded for pH, nitrite, nitrate and orthophosphate for all samples so all results will be qualified as estimated (J or UJ).

### 7.2.2 Calibrations

Initial and continuing calibrations were conducted for all analyses as applicable and calibration verification was acceptable.

### 7.2.3 Blanks

Two equipment blanks and trip blanks were submitted for analysis. The equipment blanks showed low conductivity readings and all other general chemistry parameters were non-detected. The trip blanks showed low conductivity, TDS, chloride, nitrate, alkalinity and nitrate levels.

A review of the laboratory blanks indicates no target compounds were detected to warrant requalification of the data.

### 7.2.4 Accuracy

An assessment of accuracy was made by a review of the matrix spike data. Matrix spikes for most analyses were acceptable with the exception of one spike for nitrate+nitrite-N which reported a percent recovery of 146 percent. The spike result does not affect the overall usability of the nitrate/nitrite data.

### 7.2.5 Precision

Precision was assessed by the analysis of field and laboratory duplicates. Table 7-1 presents a summary of the field duplicates. Field duplicate precision was acceptable with all RPDs reported at less than 20%.

Laboratory duplicates were analyzed for each parameter of interest. The ammonia duplicate RPD was recalculated with the correct RPD reported (15.9%). Total dissolved solids, NO<sub>3</sub>/NO<sub>2</sub>, chloride, nitrate, nitrite, bromide, ortho-phosphorus, sulfate, conductivity, fluoride, alkalinity, and pH RPDs were all less than 20%.

#### 7.2.6 System Performance and Quantitaion

The ion chromatography data was reviewed for baseline anomalies and missed target compounds and the data were acceptable. Results were reported properly and no transcription or calculation errors were noted. The results for one trip blank were not provided on the laboratory reports and the laboratory was contacted to provide corrected copies. Pending receipt of the corrected copies, the results have been handwritten on the report sheets.

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## 8. SUMMARY

Data validation was conducted on 25 water samples submitted as part of the Phase I Remedial Investigation being conducted at the 1100-EM-1 Operable Unit. The data as received from the laboratory was reported properly and complete. Analyses were conducted in accordance with the RI/FS Work Plan for the 1100-EM-1 Operable Unit, (DOE 1989). Quantitation and QA/QC limits for all analyses met or exceeded those recommended in Table 4-8 of the work plan and samples were analyzed using Level III and IV analytical procedures as required by Table 4-3 of the work plan. Data qualification necessary as a result of the data validation is summarized in Table 8-1. Results from six analyses were rejected based on the validation as summarized in Table 8-1. A tabular summary of the valid results is provided in Table 8-2. Table 8-2 presents the results for the inorganics, general chemistry analysis and organic analysis parameters. It should be noted that Table 8-2 presents only the detected results for the organic analysis parameters.

## 9. REFERENCES

Bleyler, R., 1988, Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses, United States Environmental Protection Agency, Hazardous Site Evaluation Division, Washington, D.C.

DOE, 1989, Remedial Investigation/Feasibility Study Work Plan for the 1100-EM-1 Operable Unit Hanford Site, DOE/RL 88-23, United States Department of Energy, Richland, Washington.

EPA 1989, National Functional Guidelines for Organic Data Review, Draft, United States Environmental Protection Agency, Contract Laboratory Program, Washington, D.C.

EPA 1988a, USEPA Contract Laboratory Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration, United States Environmental Protection Agency, Washington D.C.

EPA 1988b, USEPA Contract Laboratory Program, Statement of Work for Inorganics Analysis, Multi-Media, Multi-Concentration, United States Environmental Protection Agency, Washington, D.C.

TABLE 1-1

## SAMPLE IDENTIFICATION SUMMARY

Field Sample ID	Laboratory Sample ID	Sample Location	Date collected	Analyses required	Comments
BOOB45	Z795-01	MW-12	11/26/90	A	
BOOD68	Z795-02	N/A	11/26/90	C	Trip blank
BOOB48	Z795-03	MW-12	11/26/90	B	
BOOB49	Z795-04	MW-13	11/26/90	A	
BOOB50	Z795-05	MW-13	11/26/90	B	
TRIP BLANK	Z795-06	N/A	11/26/90	C	Trip blank
BOOD04	Z797-01	MW-8	11/27/90	A	
BOOD20	Z797-02	MW-8	11/27/90	B	
BOODH3	Z797-03	N/A	11/27/90	C	Trip blank
BOOD23	Z797-04	MW-9	11/27/90	A	
BOOD24	Z797-05	MW-9	11/27/90	B	
BOODG9	Z797-06	N/A	11/27/90	C	Trip blank
BOOB53	Z797-07	MW-14	11/27/90	A	
BOOB54	Z797-08	MW-14	11/27/90	B	
BOODH1	Z797-09	N/A	11/27/90	C	Trip blank
BOOB57	Z797-10	MW-15	11/27/90	A	
BOOB58	Z797-11	MW-15	11/27/90	B	
BOODH2	Z797-12	N/A	11/27/90	C	Trip blank
BOOD27	2803-01	MW-10	11/28/90	A	
BOODH4	2803-02	N/A	11/28/90	C	Trip blank
BOOD28	2803-03	MW-10	11/28/90	B	
BOOD31	2803-04	MW-10	11/28/90	A	Field Duplicate
BOODH6	2803-05	N/A	11/28/90	C	Sample placed on hold
BOOD32	2803-06	MW-10	11/28/90	B	Field Duplicate
BOOD35	2803-07	MW-11	11/28/90	A	
BOOD36	2803-08	MW-11	11/28/90	B	
BOODH5	2803-09	N/A	11/28/90	C	Trip blank
BOOD42	2803-10	699-S32-E13A	11/28/90	A	
BOOD43	2803-11	699-S32-E13A	11/28/90	B	
BOODH7	2803-12	N/A	11/28/90	C	Sample placed on hold
BOOD60	2803-13	TRIP BLANK	11/28/90	A	see Note 1

TABLE 1-1 (continued)

## SAMPLE IDENTIFICATION SUMMARY

Field Sample ID	Laboratory Sample ID	Sample Location	Date collected	Analyses required	Comments
BOOD61	2803-14	TRIP BLANK	11/28/90	B	see Note 1
BOOD62	2807-01	699-S38-E12A	11/29/90	A	
BOOD63	2807-02	699-S38-E12A	11/29/90	B	
BOODJ2	2807-03	N/A	11/29/90	C	Sample placed on hold
BOOD46	2807-04	699-S31-E13	11/29/90	A	
BOODH8	2807-05	N/A	11/29/90	C	Sample placed on hold
BOOD47	2807-06	699-S31-E13	11/29/90	B	
BOOD54	2807-07	699-S29-E12	11/29/90	A	
BOODJ0	2807-08	N/A	11/29/90	C	Sample placed on hold
BOOD55	2807-09	699-S29-E12	11/29/90	B	
BOOD50	2807-10	699-S30-15A	11/29/90	A	
BOOD51	2807-11	699-S30-15A	11/29/90	B	
BOODH9	2807-12	N/A	11/29/90	C	Trip blank
BOOD58	2807-13	699-S27-E14	11/29/90	A	
BOOD59	2807-14	699-S27-E14	11/29/90	B	
BOODJ1	2807-15	N/A	11/29/90	C	Sample placed on hold
BOOD66	2812-01	699-S38-E12B	12/03/90	A	
BOOD67	2812-02	699-S38-E12B	12/03/90	B	
BOODJ3	2812-03	N/A	12/03/90	C	Trip blank
BOOD70	2812-04	699-S38-E12B	12/03/90	A	Field Duplicate
BOOD71	2812-05	699-S38-E12B	12/03/90	B	Field Duplicate
BOODJ4	2812-06	N/A	12/03/90	C	Sample placed on hold
BOOD74	2812-07	699-S37-E11	12/03/90	A	
BOOD75	2812-08	699-S37-E11	12/03/90	B	
BOODJ5	2812-09	N/A	12/03/90	C	Sample placed on hold
BOOD78	2812-10	699-S34-E10	12/03/90	A	
BOOD79	2812-11	699-S34-E10	12/03/90	B	
BOODJ6	2812-12	N/A	12/03/90	C	Sample placed on hold
BOOD82	2812-13	699-S38-E11	12/03/90	A	
BOOD83	2812-14	699-S38-E11	12/03/90	B	
BOODJ7	2812-15	N/A	12/03/90	C	Sample placed on hold

TABLE 1-1 (continued)

## SAMPLE IDENTIFICATION SUMMARY

Field Sample ID	Laboratory Sample ID	Sample Location	Date collected	Analyses required	Comments
BOODF5	2818-01	EQUIPMENT BLANK	12/04/90	A	
BOODF6	2818-02	EQUIPMENT BLANK	12/04/90	B	
BOODK1	2818-03	N/A	12/04/90	C	Sample placed on hold
BOOD89	2818-04	699-S37-E14	12/04/90	A	
BOOD90	2818-05	699-S37-E14	12/04/90	B	
BOODJ8	2818-06	N/A	12/04/90	C	Sample placed on hold
BOODG4	2818-07	EQUIPMENT BLANK	12/04/90	A	
BOODG5	2818-08	EQUIPMENT BLANK	12/04/90	B	
BOODK0	2818-09	N/A	12/04/90	C	Trip blank
BOODK3	2822-01	HANFORD	12/06/90	A	Trip blank
BOODK4	2822-2	HANFORD	12/06/90	B	Trip blank

- A - Sample analyzed for volatiles, semi-volatiles, pesticide/PCBs, herbicides, total metals, cyanide, total organic carbon, total organic halogen, ammonia as N, fluoride, chemical oxygen demand, chloride, nitrite as N, nitrate as N, bromide, ortho-phosphorus, sulfate, alkalinity, conductivity, nitrate+nitrite as N, total dissolved solids and pH.
- B - Sample analyzed for dissolved metals only.
- C - Sample is a volatile trip blank.
1. Sample analyzed for volatiles, semi-volatiles and pesticide/PCBs remaining analyses placed on hold at the direction of WHC.

TABLE 2-1

## VOLATILE CALIBRATION SUMMARY

DATE OF CALIBRATION	COMPOUND EXCEEDING CRITERIA	PERCENT DIFFERENCE
12/5/90	Trans-1,3-dichloropropene	36.5
12/6/90	Trans-1,3-dichloropropene	36.8
12/7/90	Chloromethane	33.5
	Trans-1,3-dichloropropene	34.7
12/10/90	Chloromethane	43.5
	Trans-1,3-dichloropropene	32.5

9 2 1 2 6 4 2 0 2 9 3

TABLE 2-2

## VOLATILE RESULTS SUMMARY

FIELD ID	COMPOUND	RESULT	Q	RT	COMMENTS
BOOD66	1,1,1-TRICHLOROETHANE	3	J	0.00	
BOOB57	1,1,1-TRICHLOROETHANE	1	J	0.00	
BOOD35	1,1,1-TRICHLOROETHANE	1	J	0.00	
BOOD62	1,1,1-TRICHLOROETHANE	2	J	0.00	
BOOB49	1,1,1-TRICHLOROETHANE	1	J	0.00	
BOOD70	1,1,1-TRICHLOROETHANE	3	J	0.00	
BOOB45	1,1,1-TRICHLOROETHANE	2	J	0.00	
BOOD31	1,1,1-TRICHLOROETHANE	1	J	0.00	
BOOD66	ACETONE	6	J	0.00	
BOODH3	ACETONE	8	J	0.00	TRIP BLANK
BOODH9	ACETONE	23		0.00	TRIP BLANK
BOOD70	ACETONE	5	J	0.00	
BOOD60	ACETONE	9	J	0.00	TRIP BLANK
BOODJ3	ACETONE	18		0.00	TRIP BLANK
BOODG4	ACETONE	2	J	0.00	EQUIP. BLANK
BOOD54	ACETONE	11		0.00	
BOOD50	ACETONE	1	J	0.00	
BOODF5	ACETONE	7	J	0.00	EQUIP. BLANK
TRIP BLANK	ACETONE	5	J	0.00	TRIP BLANK
BOODG4	CHLOROFORM	3	J	0.00	EQUIP. BLANK
BOOD89	CHLOROFORM	2	J	0.00	
BOOD50	CHLOROFORM	2	J	0.00	
BOODH9	METHYLENE CHLORIDE	2	J	0.00	TRIP BLANK
BOODH2	METHYLENE CHLORIDE	1	J	0.00	TRIP BLANK

TABLE 2-2 (continued)

## VOLATILE RESULTS SUMMARY

BOODF5	METHYLENE CHLORIDE	1	J	0.00	EQUIP. BLANK
BOODG9	METHYLENE CHLORIDE	1	J	0.00	TRIP BLANK
BOOD50	METHYLENE CHLORIDE	1	J	0.00	
BOOD89	TOTAL TRIHALOMETHANES	2	J	0.00	
BOODG4	TOTAL TRIHALOMETHANES	3	J	0.00	EQUIP. BLANK
BOOD50	TOTAL TRIHALOMETHANES	2	J	0.00	
BOOD35	TRICHLOROETHENE	3		0.00	
BOOB57	TRICHLOROETHENE	59		0.00	
BOOB45	TRICHLOROETHENE	74		0.00	
BOOB49	TRICHLOROETHENE	69		0.00	
BOOB53	TRICHLOROETHENE	66		0.00	
BOOD58	TRICHLOROETHENE	1	J	0.00	
BOOD46	UNKNOWN	5	J	16.04	
BOODH3	UNKNOWN HYDROCARBON	9	J	20.89	TRIP BLANK

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TABLE 3-1

## SEMIVOLATILE CALIBRATION SUMMARY

CONTINUING CALIBRATION DATE	COMPOUND EXCEEDING CRITERIA	CRITERIA EXCEEDED
12/13/90	Benzoic acid Hexachlorocyclopentadiene 2,4-Dinitrophenol 4-Nitrophenol 4-Nitroaniline 4,6-Dinitro-2-methylphenol	%D $\geq$ $\pm$ 25%
12/14/90	Hexachlorocyclopentadiene 2,4-Dinitrophenol	%D $\geq$ $\pm$ 25%
12/15/90	bis(2-Chloroisopropyl) ether Benzoic acid 3-Nitroaniline 2,4-Dinitrophenol 4-Nitrophenol 2,4,6-Tribromophenol	%D $\geq$ $\pm$ 25%
12/18/90	3-Nitroaniline	%D $\geq$ $\pm$ 25%

TABLE 3-2

## SEMIVOLATILE RESULTS SUMMARY

FIELD ID	COMPOUND	RESULT	Q	RT	COMMENTS
BOOD78	ACETIC ACID, ETHYL ESTER	36	BJ	5.68	
SBLKDC	ACETIC ACID, ETHYL ESTER	32	J	5.68	LAB BLANK
BOODG4	ACETIC ACID, ETHYL ESTER	61	BJ	5.68	
BOOD31	ACETIC ACID, ETHYL ESTER	22	J	5.68	
BOOD82	ACETIC ACID, ETHYL ESTER	40	BJ	5.68	
BOOD27	ACETIC ACID, ETHYL ESTER	16	J	5.68	
BOOD58	ACETIC ACID, ETHYL ESTER	26	BJ	5.70	
BOOD89	ACETIC ACID, ETHYL ESTER	91	BJ	5.72	
BOOD54	ACETIC ACID, ETHYL ESTER	19	BJ	5.72	
BOOD62	ACETIC ACID, ETHYL ESTER	18	BJ	5.72	
BOOD70	ACETIC ACID, ETHYL ESTER	30	BJ	5.72	
BOODF5	ACETIC ACID, ETHYL ESTER	81	BJ	5.72	
BOOD66	ACETIC ACID, ETHYL ESTER	30	BJ	5.72	
SBLKDD	ACETIC ACID, ETHYL ESTER	24	J	5.72	LAB BLANK
BOOD50	ACETIC ACID, ETHYL ESTER	10	BJ	5.73	
BOODK3	ACETIC ACID, ETHYL ESTER	32	BJ	5.73	TRIP BLANK
BOOD42	ACETIC ACID, ETHYL ESTER	67	J	5.73	
BOOD60	ACETIC ACID, ETHYL ESTER	43	J	5.73	TRIP BLANK
SBLKDG	ACETIC ACID, ETHYL ESTER	30	J	5.73	LAB BLANK
SBLKDB	BENZOIC ACID, ETHOXY, ETHY	8	J	17.97	LAB BLANK
BOOD60	BIS-(2-ETHYLHEXYL)PHTHALATE	5	J	N/A	TRIP BLANK
BOODF5	DIACETONE ALCOHOL	89	J	6.73	
SBLKDC	DIACETONE ALCOHOL	16	J	6.73	LAB BLANK
BOOD89	DIACETONE ALCOHOL	89	J	6.73	
BOODG4	DIACETONE ALCOHOL	32	J	6.73	
BOOD82	DIACETONE ALCOHOL	16	J	6.73	
BOOD66	DIACETONE ALCOHOL	15	J	6.77	
BOOD70	DIACETONE ALCOHOL	11	J	6.77	
BOOD70	ETHANOL, 2-CHLORO, PHOSPHAT	80	J	20.85	
BOOD66	ETHANOL, 2-CHLORO, PHOSPHAT	76	J	20.89	
BOOD23	ETHANOL, 2-CHLORO-PHOSPHAT	13	J	20.84	
SBLKDC	TOLUENE	440	J	5.28	LAB BLANK
BOOD78	TOLUENE	1500	BJ	5.30	

TABLE 3-2 (continued)

## SEMIVOLATILE BLANK AND SAMPLE RESULT SUMMARY

FIELD ID	COMPOUND	RESULT	Q	RT	COMMENTS
BOOD82	TOLUENE	1600	BJ	5.32	
BOOD70	TOLUENE	1600	BJ	5.32	
BOOD89	TOLUENE	1600	BJ	5.32	
BOODF5	TOLUENE	1500	BJ	5.32	
BOOD46	TOLUENE	1800	BJ	5.32	
BOOD74	TOLUENE	2000	BJ	5.32	
BOODG4	TOLUENE	1600	BJ	5.32	
BOOD66	TOLUENE	1500	BJ	5.33	
BOOD58	TOLUENE	1700	BJ	5.33	
BOOD62	TOLUENE	1200	BJ	5.33	
BOOD54	TOLUENE	1500	BJ	5.33	
SBLKDD	TOLUENE	1300	J	5.33	
BOOD50	TOLUENE	1300	BJ	5.35	
BOODK3	TOLUENE	1900	BJ	5.37	
SBLKDG	TOLUENE	1900	J	5.37	
BOOB57	UNKNOWN	9	J	24.00	
BOOD23	UNKNOWN	34	J	24.02	
BOOB45	UNKNOWN	17	J	24.05	
BOOD04	UNKNOWN	8	J	24.07	TRIP BLANK
BOOD46	UNKNOWN	9	J	24.09	TRIP BLANK
BOOD27	UNKNOWN	8	J	37.36	TRIP BLANK
BOOD31	UNKNOWN ALCOHOL	8	J	6.73	TRIP BLANK
BOOD35	UNKNOWN ALKANE	15	J	27.09	
BOOD31	UNKNOWN ALKANE	12	J	27.09	
BOOD27	UNKNOWN ALKANE	14	J	27.11	
BOOD31	UNKNOWN ALKANE	10	J	28.72	
BOOD27	UNKNOWN ALKANE	12	J	28.74	
BOOD35	UNKNOWN ALKANE	11	J	28.74	
SBLKDB	UNKNOWN ALKANE	12	J	29.52	LAB BLANK
SBLKDB	UNKNOWN ALKANE	8	J	30.27	LAB BLANK
BOOB57	UNKNOWN FATTY ACID	9	J	22.94	
BOOD23	UNKNOWN FATTY ACID	9	J	22.94	
BOOD27	UNKNOWN FATTY ACID	12	J	22.97	

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TABLE 3-2 (continued)

## SEMIVOLATILE BLANK AND SAMPLE RESULT SUMMARY

FIELD ID	COMPOUND	RESULT	Q	RT	COMMENTS
SBLKDB	UNKNOWN HYDROCARBON	46	J	26.12	LAB BLANK
BOOD50	UNKNOWN HYDROCARBON	56	J	23.97	
BOOD62	UNKNOWN HYDROCARBON	28	J	23.97	
BOOB53	UNKNOWN HYDROCARBON	10	J	24.07	
BOOD58	UNKNOWN HYDROCARBON	19	J	24.07	
BOOD54	UNKNOWN HYDROCARBON	13	J	24.09	
BOOB57	UNKNOWN HYDROCARBON	59	BJ	26.11	
BOOD23	UNKNOWN HYDROCARBON	55	BJ	26.12	
BOOD31	UNKNOWN HYDROCARBON	110	BJ	26.12	
BOOD42	UNKNOWN HYDROCARBON	84	BJ	26.12	EQUIP. BLANK
BOOB45	UNKNOWN HYDROCARBON	42	BJ	26.12	EQUIP. BLANK
BOOD04	UNKNOWN HYDROCARBON	43	BJ	26.12	EQUIP. BLANK
BOOD35	UNKNOWN HYDROCARBON	120	BJ	26.12	EQUIP. BLANK
BOOB49	UNKNOWN HYDROCARBON	54	BJ	26.12	EQUIP. BLANK
BOOD60	UNKNOWN HYDROCARBON	67	BJ	26.12	TRIP BLANK
BOOD27	UNKNOWN HYDROCARBON	110	BJ	26.14	TRIP BLANK
BOOB53	UNKNOWN HYDROCARBON	35	BJ	26.17	TRIP BLANK
BOOD42	UNKNOWN HYDROCARBON	11	J	27.09	
BOOD23	UNKNOWN HYDROCARBON	11	J	29.52	
BOOD31	UNKNOWN HYDROCARBON	20	J	29.52	
BOOD35	UNKNOWN HYDROCARBON	21	J	29.52	
BOOD42	UNKNOWN HYDROCARBON	13	J	29.52	
BOOB57	UNKNOWN HYDROCARBON	11	J	29.52	
BOOD27	UNKNOWN HYDROCARBON	22	J	29.52	
BOOD60	UNKNOWN HYDROCARBON	12	J	29.54	TRIP BLANK
BOOB49	UNKNOWN HYDROCARBON	8	J	29.57	
BOOD04	UNKNOWN HYDROCARBON	8	J	29.59	
BOOB45	UNKNOWN HYDROCARBON	8	J	29.59	

TABLE 3-2

## SEMIVOLATILE RESULTS SUMMARY

FIELD ID	COMPOUND	RESULT	Q	RT	COMMENTS
BOOD78	ACETIC ACID, ETHYL ESTER	36	BJ	5.68	
SBLKDC	ACETIC ACID, ETHYL ESTER	32	J	5.68	LAB BLANK
BOODG4	ACETIC ACID, ETHYL ESTER	61	BJ	5.68	
BOOD31	ACETIC ACID, ETHYL ESTER	22	J	5.68	
BOOD82	ACETIC ACID, ETHYL ESTER	40	BJ	5.68	
BOOD27	ACETIC ACID, ETHYL ESTER	16	J	5.68	
BOOD58	ACETIC ACID, ETHYL ESTER	26	BJ	5.70	
BOOD89	ACETIC ACID, ETHYL ESTER	91	BJ	5.72	
BOOD54	ACETIC ACID, ETHYL ESTER	19	BJ	5.72	
BOOD62	ACETIC ACID, ETHYL ESTER	18	BJ	5.72	
BOOD70	ACETIC ACID, ETHYL ESTER	30	BJ	5.72	
BOODF5	ACETIC ACID, ETHYL ESTER	81	BJ	5.72	
BOOD66	ACETIC ACID, ETHYL ESTER	30	BJ	5.72	
SBLKDD	ACETIC ACID, ETHYL ESTER	24	J	5.72	LAB BLANK
BOOD50	ACETIC ACID, ETHYL ESTER	10	BJ	5.73	
BOODK3	ACETIC ACID, ETHYL ESTER	32	BJ	5.73	TRIP BLANK
BOOD42	ACETIC ACID, ETHYL ESTER	67	J	5.73	
BOOD60	ACETIC ACID, ETHYL ESTER	43	J	5.73	TRIP BLANK
SBLKDG	ACETIC ACID, ETHYL ESTER	30	J	5.73	LAB BLANK
SBLKDB	BENZOIC ACID, ETHOXY, ETHY	8	J	17.97	LAB BLANK
BOOD60	BIS-(2-ETHYLHEXYL)PHTHALATE	5	J	N/A	TRIP BLANK
BOODF5	DIACETONE ALCOHOL	89	J	6.73	
SBLKDC	DIACETONE ALCOHOL	16	J	6.73	LAB BLANK
BOOD89	DIACETONE ALCOHOL	89	J	6.73	
BOODG4	DIACETONE ALCOHOL	32	J	6.73	
BOOD82	DIACETONE ALCOHOL	16	J	6.73	
BOOD66	DIACETONE ALCOHOL	15	J	6.77	
BOOD70	DIACETONE ALCOHOL	11	J	6.77	
BOOD70	ETHANOL, 2-CHLORO, PHOSPHAT	80	J	20.85	
BOOD66	ETHANOL, 2-CHLORO, PHOSPHAT	76	J	20.89	
BOOD23	ETHANOL, 2-CHLORO, PHOSPHAT	13	J	20.84	
SBLKDC	TOLUENE	440	J	5.28	LAB BLANK
BOOD78	TOLUENE	1500	BJ	5.30	

TABLE 3-2 (continued)

## SEMIVOLATILE BLANK AND SAMPLE RESULT SUMMARY

FIELD ID	COMPOUND	RESULT	Q	RT	COMMENTS
BOOD82	TOLUENE	1600	BJ	5.32	
BOOD70	TOLUENE	1600	BJ	5.32	
BOOD89	TOLUENE	1600	BJ	5.32	
BOODF5	TOLUENE	1500	BJ	5.32	
BOOD46	TOLUENE	1800	BJ	5.32	
BOOD74	TOLUENE	2000	BJ	5.32	
BOODG4	TOLUENE	1600	BJ	5.32	
BOOD66	TOLUENE	1500	BJ	5.33	
BOOD58	TOLUENE	1700	BJ	5.33	
BOOD62	TOLUENE	1200	BJ	5.33	
BOOD54	TOLUENE	1500	BJ	5.33	
SBLKDD	TOLUENE	1300	J	5.33	
BOOD50	TOLUENE	1300	BJ	5.35	
BOODK3	TOLUENE	1900	BJ	5.37	
SBLKDG	TOLUENE	1900	J	5.37	
BOOB57	UNKNOWN	9	J	24.00	
BOOD23	UNKNOWN	34	J	24.02	
BOOB45	UNKNOWN	17	J	24.05	
BOOD04	UNKNOWN	8	J	24.07	TRIP BLANK
BOOD46	UNKNOWN	9	J	24.09	TRIP BLANK
BOOD27	UNKNOWN	8	J	37.36	TRIP BLANK
BOOD31	UNKNOWN ALCOHOL	8	J	6.73	TRIP BLANK
BOOD35	UNKNOWN ALKANE	15	J	27.09	
BOOD31	UNKNOWN ALKANE	12	J	27.09	
BOOD27	UNKNOWN ALKANE	14	J	27.11	
BOOD31	UNKNOWN ALKANE	10	J	28.72	
BOOD27	UNKNOWN ALKANE	12	J	28.74	
BOOD35	UNKNOWN ALKANE	11	J	28.74	
SBLKDB	UNKNOWN ALKANE	12	J	29.52	LAB BLANK
SBLKDB	UNKNOWN ALKANE	8	J	30.27	LAB BLANK
BOOB57	UNKNOWN FATTY ACID	9	J	22.94	
BOOD23	UNKNOWN FATTY ACID	9	J	22.94	
BOOD27	UNKNOWN FATTY ACID	12	J	22.97	

TABLE 3-2 (continued)

## SEMIVOLATILE BLANK AND SAMPLE RESULT SUMMARY

FIELD ID	COMPOUND	RESULT	Q	RT	COMMENTS
SBLKDB	UNKNOWN HYDROCARBON	46	J	26.12	LAB BLANK
BOOD50	UNKNOWN HYDROCARBON	56	J	23.97	
BOOD62	UNKNOWN HYDROCARBON	28	J	23.97	
BOOB53	UNKNOWN HYDROCARBON	10	J	24.07	
BOOD58	UNKNOWN HYDROCARBON	19	J	24.07	
BOOD54	UNKNOWN HYDROCARBON	13	J	24.09	
BOOB57	UNKNOWN HYDROCARBON	59	BJ	26.11	
BOOD23	UNKNOWN HYDROCARBON	55	BJ	26.12	
BOOD31	UNKNOWN HYDROCARBON	110	BJ	26.12	
BOOD42	UNKNOWN HYDROCARBON	84	BJ	26.12	EQUIP. BLANK
BOOB45	UNKNOWN HYDROCARBON	42	BJ	26.12	EQUIP. BLANK
BOOD04	UNKNOWN HYDROCARBON	43	BJ	26.12	EQUIP. BLANK
BOOD35	UNKNOWN HYDROCARBON	120	BJ	26.12	EQUIP. BLANK
BOOB49	UNKNOWN HYDROCARBON	54	BJ	26.12	EQUIP. BLANK
BOOD60	UNKNOWN HYDROCARBON	67	BJ	26.12	TRIP BLANK
BOOD27	UNKNOWN HYDROCARBON	110	BJ	26.14	TRIP BLANK
BOOB53	UNKNOWN HYDROCARBON	35	BJ	26.17	TRIP BLANK
BOOD42	UNKNOWN HYDROCARBON	11	J	27.09	
BOOD23	UNKNOWN HYDROCARBON	11	J	29.52	
BOOD31	UNKNOWN HYDROCARBON	20	J	29.52	
BOOD35	UNKNOWN HYDROCARBON	21	J	29.52	
BOOD42	UNKNOWN HYDROCARBON	13	J	29.52	
BOOB57	UNKNOWN HYDROCARBON	11	J	29.52	
BOOD27	UNKNOWN HYDROCARBON	22	J	29.52	
BOOD60	UNKNOWN HYDROCARBON	12	J	29.54	TRIP BLANK
BOOB49	UNKNOWN HYDROCARBON	8	J	29.57	
BOOD04	UNKNOWN HYDROCARBON	8	J	29.59	
BOOB45	UNKNOWN HYDROCARBON	8	J	29.59	

TABLE 5-2

## HERBICIDE DATA REQUALIFICATION SUMMARY

COMPOUNDS	QUALIFIER	SAMPLES AFFECTED	EXPLANATION
2,4-D and 2,4,5-TP (Silvex)	R	BOOD23 BOOD42 BOOD82	Surrogate recovery <10%
2,4-D and 2,4,5-TP (Silvex)	UJ	BOOB53 BOOB57 BOOD54 BOOD50 BOODG4	Surrogate recovery ≥10% but <24%

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TABLE 6-1

## INORGANIC FIELD BLANK SUMMARY

FIELD SAMPLE ID	SAMPLE TYPE	ANALYTE	CONCENTRATION ug/L
BOODF5	Equipment blank	Calcium, (total)	61.5 B
BOODG4	Equipment Blank	Iron, (total) Calcium, (total)	42.8 B 49.5 B
BOODK3	Trip Blank	Barium, (total) Calcium, (total) Manganese, (total)	38.8 B 3650 B 17.9
BOODK4	Trip Blank	Barium, (diss.) Calcium, (diss.) Manganese, (diss.)	34.9 B 3040 B 17.3

9 2 1 2 6 4 2 0 3 0 4

TABLE 6-2

## INORGANIC BLANK REQUALIFICATION SUMMARY

ANALYTE	HIGHEST LAB BLANK	FIVE TIMES BLANK	QUALIFIER	SAMPLES AFFECTED	FINAL RESULT
Total Metals Data					
Calcium	70.5	352.5	U	BOODG4	131 B to 131 U
Magnesium	47.1	235.5	U	BOODF5 BOODG4 BOODK3	45.1 B to 45.1 U 44.5 B to 44.5 U 221 B to 221 U
Sodium	150.4	752	U	BOODF5 BOOD89 BOODG4 BOODK3	136 B to 136 U 2790 B to 2790 U 209 B to 209 U 651 B to 651 U
Potassium	743.7	3718.5	U	BOODF5 BOOD89 BOODG4 BOODK3	683 B to 683 U 2100 B to 2100 U 497 B to 497 U 593 B to 593 U
Zinc	13.1	65.5	U	BOOD42 BOOD46 BOOD50 BOOD58 BOOD74	10.7 B to 10.7 U 43.4 B to 43.4 U 39.7 B to 39.7 U 8 B to 8 U 10 B to 10 U
Dissolved Metals Data					
Aluminum	30.5	152.5	U	BOOD63 BOOD51 BOOD67	27 B to 27 U 32.9 B to 32.9 U 31.2 B to 31.2 U
Magnesium	47.9	239.5	U	BOODF6 BOODG5 BOODK4	64.3 B to 64.3 U 62.2 B to 62.2 B 207 B to 207 U
Potassium	767.3	3836.5	U	BOOD90 BOODF6 BOODG5 BOODK4	2450 B to 2450 U 955 B to 955 U 965 B to 965 U 1070 B to 1070 U

TABLE 6-2 (continued)

## INORGANIC BLANK REQUALIFICATION SUMMARY

ANALYTE	HIGHEST LAB BLANK	FIVE TIMES BLANK	QUALIFIER	SAMPLES AFFECTED	FINAL RESULT
Sodium	112.3	560	U	BOODF6 BOODG5 BOODK4	255 B to 255 U 136 B to 136 U 512 B to 512 U
Zinc	9.1	45.5	U	BOOD43 BOOD63 BOOD47 BOOD55 BOOD51 BOOD59 BOOD67 BOOD71 BOOD79 BOOD90 BOODF6 BOOD65 BOODK4	14.8 B to 14.8 U 9.5 B to 9.5 U 17.8 B to 17.8 U 11.5 B to 11.5 U 38.8 B to 38.8 U 9.9 B to 9.9 U 8.6 B to 8.6 U 8.9 B to 8.9 U 10.8 B to 10.8 U 23.9 B to 23.9 U 23.6 B to 23.6 U 18.5 B to 18.5 U 18.2 B to 18.2 U

TABLE 6-3

## INORGANIC FIELD DUPLICATE SUMMARY

ANALYTE	TOTAL METALS ug/L			DISSOLVED METALS ug/L		
	BOOD27	BOOD31	RPD	BOOD28	BOOD32	RPD
Aluminum	355	112 B	104	25.0 U	25.0 U	NC
Antimony	40 U	40.0 U	NC	40.0 U	40.0 U	NC
Arsenic	3.3 B	3.7 B	11	3.3 B	5.1 B	43
Barium	91.5 B	87.2 B	5	84.2 B	85.0 B	1
Beryllium	1.0 U	1.0 U	NC	1.0 U	1.0 U	NC
Cadmium	5.0 U	5.0 U	NC	5.0 U	5.0 U	NC
Calcium	93000	92500	1	92100	91400	1
Chromium	10.0 U	10.0 U	NC	10.0 U	10.0 U	NC
Cobalt	10.0 U	10.0 U	NC	10.0 U	10.0 U	NC
Copper	5.0 U	5.0 U	NC	5.0 U	5.0 U	NC
Iron	667	243	93	25.0 U	25.0 U	NC
Lead	3.4	3.0 U	NC	3.0 U	3.0 U	NC
Magnesium	21100	20600	2	19600	19700	1
Manganese	22.9	13.5 B	52	8.4 B	10.5 B	22
Mercury	0.2 U	0.20 U	NC	0.20 U	0.20 U	NC
Nickel	20.0 U	20.0 U	NC	20.0 U	20.0 U	NC
Potassium	8320	8330	0.1	8120	8000	2
Selenium	3.0 U	3.0 U	NC	3.0 U	3.0 U	NC
Silver	10.0 U	10.0 U	NC	10.0 U	10.0 U	NC
Sodium	30400	29400	3	28200	28700	2
Thallium	2.0 U	2.0 U	NC	2.0 U	2.0 U	NC
Vanadium	10.0 U	10.0 U	NC	10.0 U	10.0 U	NC
Zinc	8.0 U	8.0 U	NC	8.0 U	8.0 U	NC
Cyanide	10.0 U	10.0 U	NC	N/A	N/A	N/A

RPD - Relative Percent Difference. Calculated by the difference between two measurements divided by the average of the two measurements and multiplied by 100.

NC - Indicates the result can not be calculated due to one or both of the results being reported as not detected or "U".

N/A - Indicates the analyte was not analyzed for in the sample.

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TABLE 6-3 (continued)

## INORGANIC FIELD DUPLICATE SUMMARY

Analyte	Total Metals ug/L			Dissolved Metals ug/L		
	BOOD66	BOOD70	RPD	BOOD67	BOOD71	RPD
Aluminum	25.0 U	25.0 U	NC	25.0 U	31.2 B	NC
Antimony	40.0 U	40.0 U	NC	40.0 U	40.0 U	NC
Arsenic	7.0 B	6.6 B	6	5.8 B	5.8 B	0
Barium	54.1 B	54.6 B	7	54.4 B	53.1 B	148
Beryllium	1.0 U	1.0 U	NC	1.0 U	1.0 U	NC
Cadmium	5.0 U	5.0 U	NC	5.0 U	5.0 U	NC
Calcium	34100	33900	1	33500	33600	0.3
Chromium	10.0 U	10.0 U	NC	10.0 U	10.0 U	NC
Cobalt	10.0 U	10.0 U	NC	10.0 U	10.0 U	NC
Copper	5.0 U	5.0 U	NC	5.0 U	5.0 U	NC
Iron	25.0 U	25.0 U	NC	25.0 U	35.1 B	NC
Lead	3.0 U	3.0 U	NC	3.0 U	3.0 U	NC
Magnesium	7140	7120	0	6990	7020	0.4
Manganese	5.9 B	6.9 B	16	5.0 U	5.0 U	NC
Mercury	0.2 U	0.20 U	NC	0.20 U	0.20 U	NC
Nickel	20.0 U	20.0 U	NC	20.0 U	20.0 U	NC
Potassium	5000	4900 B	2	4950 B	4910 B	1
Selenium	3.0 U	3.0 U	NC	3.0 U	3.0 U	NC
Silver	10.0 U	10.0 U	NC	10.0 U	10.0 U	NC
Sodium	17900	17300	3	17900	18000	1
Thallium	2.0 U	2.0 U	NC	2.0 U	2.0 U	NC
Vanadium	10.0 U	10.0 U	NC	10.0 U	10.0 U	NC
Zinc	8.0 U	8.0 U	NC	8.0 U	8.9 B	NC
Cyanide	10.0 U	10.0 U	NC	N/A	N/A	N/A

RPD - Relative Percent Difference. Calculated by the difference between two measurements divided by the average of the two measurements and multiplied by 100.

NC - Indicates the result can not be calculated due to one or both of the results being reported as not detected or "U".

N/A - Indicates the analyte was not analyzed for in the sample.

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TABLE 7-1

## GENERAL CHEMISTRY FIELD DUPLICATE SUMMARY

Client Sample ID Lab ID Date Collected Well ID	BOOD27 2803-01 11/28/90 MW-10	BOOD31 2803-04 11/28/90 MW-10	Relative Percent Difference RPD	BOOD66 2812-01 12/03/90 S36-E12B	BOOD70 2812-04 12/03/90 S36-E12B	Relative Percent Difference RPD
Compound						
Fluoride	0.356	0.324	9	.276	.293	6
Chloride	19.1	19.3	1	6.08	5.87	4
Nitrate (NO3-N)	38.3	38.2	1	1.65	1.65	0
Sulfate	69.8	72.0	3	18.1	18.3	1
Alkalinity	152	154	1	126	128	2
Conductivity	811	813	1	314	311	1
Total Dissolved Solids	559	549	2	201	197	2
pH	7.38	7.5	2	7.31	7.4	1

TABLE 8-1

## SAMPLE DATA REQUALIFICATION SUMMARY

COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Volatile Organic Compounds			
Methylene chloride	5 U	BOOD50	Sample concentration <5X the field blank concentration
Acetone	10 U 10 U 11 U 10 U	BOOD66 BOOD70 BOOD54 BOOD50	Sample concentration <5X the field blank concentration
Chloroform and Total Trihalomethanes	5 U 5 U	BOOD89 BOOD50	Sample conc. <5X the field blank conc.
Semivolatile Organic Compounds			
Toluene	U	BOOD78, BOOD82, BOOD70, BOOD89, BOODF5, BOOD46, BOOD74, BOOD64, BOOD66, BOOD58, BOOD62, BOOD54, BOOD50, BOODK3	Sample concentration <5X the lab blank concentration
Diacetone Alcohol	U	BOODF5, BOOD89, BOODG4, BOOD82, BOOD66, BOOD70	Sample concentration <5X the lab blank concentration
Acetic Acid, Ethyl ester	U	BOOD78, BOODG4, BOOD31, BOOD82, BOOD27, BOOD58, BOOD89, BOOD54, BOOD62, BOOD70, BOODF5, BOOD66, BOOD50, BOODK3, BOOD42, BOOD60	Sample concentration <5X the lab blank concentration
Unknown Semivolatile TIC at 24.00 to 24.05 mins.	U	BOOB57, BOOD23, BOOB45	Sample concentration <5X the trip blank concentration

TABLE 8-1 (continued)

## SAMPLE DATA REQUALIFICATION SUMMARY

COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Unknown Hydrocarbon Semivolatile TIC at 26.11 to 26.17 mins.	U	BOOB57, BOOD23, BOOD31, BOOD42, BOOB45, BOOD04, BOOD35, BOOB49, BOOD60	Sample concentration <5X the lab blank concentration
Unknown Semivolatile TIC at 29.52 to 29.59 mins.	U	BOOD23, BOOD31, BOOD35, BOOD42, BOOD57, BOOD27, BOOB49, BOOD04, BOOB45	Sample concentration <5X the field blank concentration
Herbicide Organic Compounds			
2,4-D	R	BOOD23, BOOD42, BOOD82	Surrogate recoveries <10%
2,4,5-TP (Silvex)	R	BOOD23, BOOD42, BOOD82	Surrogate recoveries <10%
2,4-D	UJ	BOOB53, BOOB57, BOOD54, BOOD50, BOOD64	Surrogate recoveries $\geq 10\%$ but <24%
2,4,5-TP (Silvex)	UJ	BOOB53, BOOB57, BOOD54, BOOD50, BOOD64	Surrogate recoveries $\geq 10\%$ but <24%
Inorganic Analyses			
Calcium	U	BOODG4	Sample concentration <5X the lab blank concentration
Sodium	U	BOODF5, BOOD89, BOODG4, BOODK3, BOODF6, BOOD65, BOODK4	Sample concentration <5X the lab blank concentration
Potassium	U	BOODF5, BOOD89, BOODG4, BOODK3, BOOD90, BOODF6, BOOD65, BOODK4	Sample concentration <5X the lab blank concentration

TABLE 8-1 (continued)

## SAMPLE DATA REQUALIFICATION SUMMARY

COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Zinc	U	BOOD42, BOOD46, BOOD50, BOOD58, BOOD74, BOOD43, BOOD63, BOOD47, BOOD55, BOOD51, BOOD67, BOOD71, BOOD79, BOOD90, BOODF6, BOOD65, BOODK4	Sample concentration <5X the lab blank concentration
Arsenic	BJ	BOOD42, BOOD46, BOOD54, BOOD50, BOOD58	Post digestion spike recoveries <85% or >115% and sample absorbance <50% of the spike absorbance and sample results >IDL
Arsenic	UJ	BOOD68, BOOD67, BOOD71, BOOD75, BOOD79, BOOD83, BOOD90	Post digestion spike recoveries <85% or >115% and sample absorbance is <50% of the spike absorbance and sample results <IDL
Lead	UJ	BOOD42, BOOD46	Post digestion spike recoveries <85% or >115% and sample absorbance is <50% of the spike absorbance and sample results <IDL
Magnesium	J	BOOD66, BOOD70, BOOD74, BOOD78, BOOD82, BOOD89	ICP serial dilution %D >10% for results >50X the IDL

TABLE 8-1 (continued)

## SAMPLE DATA REQUALIFICATION SUMMARY

COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Selenium	UJ	BOOD66, BOOD70, BOOD74, BOOD78, BOOD82 and all dissolved metals samples	Post digestion spike recoveries <85% or >115% and sample absorbance is <50% of the spike absorbance and sample results <IDL
Sodium	J	BOOD66, BOOD70, BOOD74, BOOD78, BOOD82, BOOD89	ICP serial dilution %D >10% for sample results >50X the IDL
Thallium	UJ	BOOB45, BOOB49, BOOD27, BOOD35, BOOD66, BOOD70, BOOD74, BOOD78, BOOD82, BOOD36, BOOD83, BOOD71, BOOD75	Post digestion spike recoveries <85% or >115% and sample absorbance is <50% of the spike absorbance and sample results <IDL
Aluminum	U	BOOD63, BOOD51, BOOD71	Sample concentration <5X the lab blank concentration
Total organic halogen	U	All samples	Sample result <5X the field blank concentration
Total organic carbon	U	BOOD23, BOOD31, BOOD62, BOOD54, BOOD58, BOOD66, BOOD70, BOOD74, BOOD78, BOOD82, BOODF5, BOOD89	Sample result <5X the field blank concentration
pH	J	All samples	Holding time exceeded
Nitrite as N	J (results > IDL) UJ (results < IDL)	All samples	Holding time exceeded
Nitrate as N	J (results > IDL) UJ (results < IDL)	All samples	Holding time exceeded

TABLE 8-1 (continued)

## SAMPLE DATA REQUALIFICATION SUMMARY

COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Ortho-phosphate as P	J (results > IDL) UJ (results < IDL)	All samples	Holding time exceeded

92126120314

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92126420315

TABLE 8-2  
VALIDATED RESULTS SUMMARY

Well ID:	MW-12	MW-13	MW-8	MW-9	MW-14	MW-15	MW-10	MW-10	MW-11	689-S32-E13A	689-S38-E12A	689-S31-E13	689-S29-E12	689-S30-15A
Field ID:	BOOB46	BOOB48	BOOB44	BOOB23	BOOB53	BOOB57	BOOB27	BOOB31	BOOB35	BOOB42	BOOB62	BOOB46	BOOB64	BOOB68
Field ID (Pias. metal):	BOOB46	BOOB48	BOOB44	BOOB23	BOOB53	BOOB57	BOOB27	BOOB31	BOOB35	BOOB42	BOOB62	BOOB46	BOOB64	BOOB68
Lab ID:	2795-01	2795-04	2797-01	2797-04	2797-07	2797-10	2803-01	2803-04	2803-07	2803-10	2807-01	2807-04	2807-07	2807-10
Lab ID (Pias. metal sp.):	2795-03	2795-05	2797-02	2797-05	2797-08	2797-11	2803-02	2803-06	2803-08	2803-11	2807-02	2807-05	2807-08	2807-11
Date sampled:	11/26/90	11/26/90	11/27/90	11/27/90	11/27/90	11/27/90	11/28/90	11/28/90	11/28/90	11/28/90	11/29/90	11/29/90	11/29/90	11/29/90

VOLATILE ORGANICS (ug/L)

1,1,1-Trichloroethane	2 J	1 J	5 U	5 U	1 J	1 J	5 U	1 J	1 J	5 U	2 J	5 U	5 U	5 U
Trichloroethene	74	69	2 U	2 U	66	59	2 U	2 U	3	2 U	2 U	2 U	2 U	2 U
Unknown @ 16.04 mins.												5 J		

SEMI-VOLATILE ORGANICS (ug/L)

Di(2-Ethylhexyl)phthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethanol, 2-chloro, phosphate				13 J										
Unknown fatty acid @ 22.94				8.5 J										
Unknown fatty acid @ 22.97														
Unknown hydrocarbon @ 23.97														
Unknown hydrocarbon @ 24.07														
Unknown hydrocarbon @ 24.09														
Unknown hydrocarbon @ 27.09														
Unknown alkane @ 27.09														
Unknown alkane @ 27.11														
Unknown alkane @ 28.72														
Unknown alkane @ 28.74														
Unknown @ 37.36														

52

9 2 1 2 6 4 2 0 3 1 6

TABLE 8-2  
VALIDATED RESULTS SUMMARY

Well ID:	689-S37-E14	689-S38-E128	689-S38-E128	689-S38-E128	689-S37-E11	689-S31-E10	689-S38-E11	Equip. Blank	689-S37-E14	Equip. Blank	HANFORD	TRIP BLANK
Field ID:	800056	800066	800070	800074	800075	800078	800082	8000F5	800089	8000G4	8000K3	800060
Field ID (Diss. metal):	800059	800067	800071	800075	800079	800083	800087	8000F6	800090	8000G5	8000K4	800061
Lab ID:	2807-13	2812-01	2812-04	2812-07	2812-10	2812-13	2812-14	2818-01	2818-04	2818-07	2822-01	2803-13
Lab ID (Diss. metal ap.)	2807-14	2823-02	2812-05	2812-08	2812-11	2812-14	2812-14	2818-02	2818-05	2818-08	2822-02	2803-14
Date sampled:	11/28/90	12/03/90	12/03/90	12/03/90	12/03/90	12/03/90	12/03/90	12/04/90	12/04/90	12/04/90	12/05/90	11/28/90

## VOLATILE ORGANICS (ug/L)

1,1,1-Trichloroethane	5U	3J	3J	3J	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
Unknown @ 16.04 min.												

## SEMI-VOLATILE ORGANICS (ug/L)

Di(2-Ethylhexyl)phthalate	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	5J
Ethanol, 2-chloro, phosphate		76J										
Unknown fatty acid @ 22.94												
Unknown fatty acid @ 22.97												
Unknown hydrocarbon @ 23.97												
Unknown hydrocarbon @ 24.07												
Unknown hydrocarbon @ 24.09												
Unknown hydrocarbon @ 27.09												
Unknown alkane @ 27.09												
Unknown alkane @ 27.11												
Unknown alkane @ 28.72												
Unknown alkane @ 28.74												
Unknown @ 37.35												

92126420317

TABLE 8-2  
VALIDATED RESULTS SUMMARY

Well ID:	MW-12	MW-13	MW-8	MW-9	MW-14	MW-15	MW-10	MW-10	MW-11	689-S32-E13A	689-S32-E12A	689-S31-E13	689-S32-E12	689-S30-15A
Field ID: (Dist. metals):	800846	800849	800804	800823	800853	800857	800827	800831	800835	800842	800842	800844	800854	800850
Lab ID:	2795-01	2795-04	2797-01	2797-04	2797-07	2797-10	2803-01	2803-02	2803-03	2803-10	2803-01	2807-04	2807-07	2807-10
Lab ID (dist. metals apl.):	2795-03	2795-05	2797-02	2797-05	2797-08	2797-11	2803-02	2803-06	2803-08	2803-11	2807-02	2807-05	2807-08	2807-11
Date sampled:	11/26/90	11/26/90	11/27/90	11/27/90	11/27/90	11/27/90	11/28/90	11/28/90	11/28/90	11/28/90	11/28/90	11/29/90	11/29/90	11/29/90

TOTAL METALS (ug/L)

Aluminum	25 U	25 U	158 B	25 U	25 U	25 U	355	112 B	112 B	25 U	25 U	36 B	25 U	25 U
Antimony	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
Arsenic	4.3 B	4.2 B	8.6 B	2.2 B	2.1 B	4.8 B	3.3 B	3.7 B	2 B	3.2 B	5.6 B	4.6 B	6.1 B	3.1 B
Barium	107 B	83.6 B	50.9 B	60.5 B	87.4 B	74.5 B	91.5 B	87.2 B	90.6 B	80 B	35.8 B	77.9 B	41.8 B	57.1
Beryllium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Calcium	107000	99000	54000	18500 U	103000	80000	90000	92500	99200	83700	90300	74900	44700	67100
Chromium	10 U	10 U	10 U	10 U	16.1	15.9	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cobalt	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Copper	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Iron	40.8 B	44.8 B	184	25 U	79.7 B	77.7 B	687	243	230	72.8 B	25 U	11900	191	106
Lead	3 U	3 U	3 U	3 U	3 U	3 U	3.4	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Magnesium	23500	22000	13900	4790 B	23400	18000	21100	20000	22700	16900	8140	15700	9570	13000
Manganese	5 U	7.9 B	19.4	139	90.2	5 U	22.9	13.5 B	107	5 U	5 U	107	5 U	5 U
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Potassium	6720	6340	5370	4150 B	8710	7460	8320	8300	9170	8690	4049 B	6890	5670	6450
Selenium	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Silver	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	31700	29700	19000	19000	30000	26300	30400	29400	31400	13000	12700	13000	20200	11500
Thallium	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vanadium	10 U	10 U	12.6 B	10 U	10 U	12.6 B	10 U	10 U	10 U	10 U	12.6 B	16.9 B	14.1 B	10 U
Zinc	8 U	8 U	8 U	8 U	8 U	8 U	8 U	8 U	8 U	10.7 U	8 U	43.4 U	8 U	39.7 U
Cyanide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

9 2 1 2 6 4 2 0 3 1 8

TABLE 8-2  
VALIDATED RESULTS SUMMARY

Well ID:	699-S27-E14	699-S38-E12B	699-S38-E12B	699-S37-E11	699-S31-E10	699-S38-E11	Equip. Blank	699-S37-E14	Equip. Blank	HANFORD
Field ID:	800058	800066	800070	800074	800078	800082	8000F5	800088	8000G4	8000K3
Field ID (Diss. metals):	800059	800067	800071	800075	800079	800083	8000F6	800090	8000G5	8000K4
Lab ID:	2807-13	2812-01	2812-04	2812-07	2812-10	2812-13	2818-01	2818-04	2818-07	2822-01
Lab ID (diss. metals spl.)	2807-14	2823-02	2812-05	2812-08	2812-11	2812-14	2818-02	2818-05	2818-08	2822-02
Date sampled:	11/29/90	12/03/90	12/03/90	12/03/90	12/03/90	12/03/90	12/04/90	12/04/90	12/04/90	12/06/90

## TOTAL METALS (ug/L)

Aluminum	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Antimony	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
Arsenic	4.6 B	7 B	606 B	5.6 B	5.2 B	8.2 B	2 U	2.1 B	2 U	2 U
Barium	43.5 B	54.1 B	54.6 B	38.6 B	49 B	40.1 B	15 U	15 U	15 U	38.8 B
Beryllium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Calcium	51200	34100	33900	38600	42100	46800	40 U	22800	131 U	3850 B
Chromium	10 U	10 U	10 U	12.5	10.3	10 U	10 U	10 U	10 U	10 U
Cobalt	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Copper	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Iron	105	25 U	25 U	91.3 B	76 B	78.5 B	25 U	45.1 B	42.8 B	25 U
Lead	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Magnesium	10800	7140 J	7120 J	8930 J	9290 J	9200 J	45.1 B	4190 B	44.5 B	221 B
Manganese	5 U	5.9 B	6.9 B	7 B	7.5 B	5 U	5 U	5 U	5 U	17.9
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	20 U	20 U	20 U	20 B	20 U	20 U	20 U	20 U	20 U	20 U
Potassium	6250	5000	4900 B	5320	5830	6300	683 B	2180 B	467 B	583 B
Selenium	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Silver	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	21000	17300 J	17300 J	19000 J	19600 J	22400 J	136 U	2790 U	208 U	651 U
Thallium	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vanadium	11.1 B	10 U	10 U	10 U	10 U	12.4 B	10 U	10 U	10 U	10 U
Zinc	8 U	8 U	8 U	10 U	8 U	8 U	8 U	8 U	8 U	8 U
Cyanide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Golder Associates

WHC-MR- 0299  
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**DISSOLVED METALS (u/L)**

**Golder Associates**

9 2 1 2 6 4 2 0 3 2 0

TABLE 8-2  
VALIDATED RESULTS SUMMARY

Well ID:	699-S27-E14	699-S36-E12B	699-S36-E12B	699-S37-E11	699-S31-E10	699-S39-E11	Equip. Blank	699-S37-E14	Equip. Blank	HANFORD
Field ID:	800058	800066	800070	800074	800078	800082	8000F5	800089	8000G4	8000K3
Field ID (Diss. metals):	800059	800067	800071	800075	800079	800083	8000F6	800090	8000G5	8000K4
Lab ID:	2807-13	2812-01	2812-04	2812-07	2812-10	2812-13	2818-01	2818-04	2818-06	2822-01
Lab ID (diss. metals spl.):	2807-14	2823-02	2812-05	2812-08	2812-11	2812-14	2818-02	2818-05	2818-08	2822-02
Date sampled:	11/29/90	12/03/90	12/03/90	12/03/90	12/03/90	12/03/90	12/04/90	12/04/90	12/04/90	12/06/90

DISSOLVED METALS (ug/L)

Aluminum	25 U	31.2 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Antimony	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
Arsenic	4.4 BJ	5.8 BJ	4 BJ	4 BJ	4.9 BJ	7.7 BJ	2 U	2 U	2 U	2 U
Barium	44.4 B	53.1 B	40.1 B	40.1 B	50.5 B	39.8	15 U	15 U	15 U	34.9 B
Beryllium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Calcium	51200	33800	40000	40000	43800	46800	61.5 B	22500	48.5 B	3040 B
Chromium	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cobalt	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Copper	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Iron	25 U	35.1 B	33.8 B	33.8 B	56.6 B	25 U	25 U	37.4 B	25 U	25 U
Lead	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Magnesium	10200	7020	9200	9200	9570	9070	64.3 B	4130 B	62.2 B	207 B
Manganese	5 U	5 U	5.4 B	5.4 B	6.8 B	5 U	5 U	5 U	5 U	17.3
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	20 U	20 U	20 B	20 B	20 U	20 U	20 U	20 U	20 U	20 U
Potassium	8040	4910 B	5480	5480	6270	6450	955 B	2450 B	965 B	1070 B
Selenium	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Silver	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	20500	18000	19700	19700	20300	21900	255 U	2680 U	136 U	512 U
Thallium	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vanadium	10 U	10 U	10 U	10 U	10 U	11.9 B	10 U	10 U	10 U	10 U
Zinc	8.9 U	8.9 U	8.9 U	8.9 U	10.8 U	8 U	23.6 U	23.9 U	18.5 U	18.2 U

9 2 1 2 6 4 2 0 3 2 1

TABLE 8-2  
VALIDATED RESULTS SUMMARY

Well ID:	MW-12	MW-13	MW-8	MW-9	MW-14	MW-15	MW-10	MW-10	MW-11	899-S32-E13A	899-S38-E12A	899-S31-E13	899-S29-E12	899-S30-15A
Field ID:	800845	800849	800004	800023	800853	800857	800027	800031	800035	800042	800062	800046	800054	800050
Field ID (Dis. metals):	800848	800850	800020	800024	800854	800858	800028	800032	800036	800043	800063	800047	800056	800051
Lab ID:	2795-01	2795-04	2797-01	2797-04	2797-07	2797-10	2803-01	2803-04	2803-07	2803-10	2807-01	2807-04	2807-07	2807-10
Lab ID (Dis. metals spl.):	2795-03	2795-05	2797-02	2797-05	2797-08	2797-11	2803-02	2803-06	2803-08	2803-11	2807-02	2807-05	2807-08	2807-11
Date sampled:	11/26/90	11/26/90	11/27/90	11/27/90	11/27/90	11/27/90	11/28/90	11/28/90	11/28/90	11/28/90	11/29/90	11/29/90	11/29/90	11/29/90

## WET CHEMISTRY (mg/L)

Ammonia (NH3-N)	0.085	0.080	0.050 U	0.088	0.05 U	0.05 U	0.05 U	0.05 U	0.237	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Fluoride	0.330	0.549	0.303	0.427	0.373	0.601	0.356	0.324	0.29	0.212	0.215	0.211	0.303	0.194
Chemical Oxygen Demand	5.2	6.2	5 U	5 U	5.6	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5	5 U
Chloride	18	14.4	15.7	2.01	15.7	14	19.1	19.3	18.5	6.73	7.05	6.87	10.3	5.25
Nitrite (NO2-N)	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.336 J	0.1 UJ	0.1 UJ	0.1 UJ	0.736 J	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Nitrate (NO3-N)	50.9 J	46.7 J	7.03 J	0.1 UJ	49.9 J	31 J	38.3 J	38.2 J	46.5 J	4.11 J	1.5 J	3.49 J	3.84 J	2.11 J
Bromide	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ortho-Phosphorus (PO4-P)	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Sulfate	79.9	74.1	31.5	16	82.6	60.3	69.8	72	75.4	8.7	15.6	17.2	32.1	15.7
Alkalinity (as mg/L CaCO3)	171	167	162	92	167	158	152	154	151	272	133	288	144	231
Conductivity (umhos/cm @ 25C)	918	883	478	220	911	718	811	813	886	808	297	522	377	458
Nitrate/Nitrite-N	---	---	---	0.024	---	---	---	---	---	---	---	---	---	---
Total Dissolved Solids	844	811	297	162	633	496	559	549	600	380	212	346	267	304
pH (s.u.)	7.43 J	7.55 J	7.69 J	7.9 J	7.74 J	7.74 J	7.38 J	7.5 J	7.57 J	7.12 J	7.27 J	7.1 J	7.4 J	7.25 J
Total Organic Carbon (TOC)	38	41	28	23 U	24	33	26	23 U	28	43	17 U	38	22 U	28
Total Organic Halides (TOH)	0.082 U	0.074 U	0.141 U	0.078 U	0.109 U	0.097 U	0.071 U	0.130 U	0.077 U	0.071 U	0.079 U	0.080 U	0.094 U	0.088 U

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TABLE 8-2  
VALIDATED RESULTS SUMMARY

Well ID:	699-S27-E14	699-S36-E12B	699-S36-E12B	699-S37-E11	699-S31-E10	699-S38-E11	Equip. Blank	699-S37-E14	Equip. Blank	HANFORD
Field ID:	BOOD68	BOOD68	BOOD70	BOOD74	BOOD78	BOOD82	BOOD85	BOOD88	BOOD84	BOODK3
Field ID (Dist. metadata):	BOOD68	BOOD67	BOOD71	BOOD75	BOOD79	BOOD83	BOOD84	BOOD88	BOOD86	BOODK4
Lab ID:	2807-13	2812-01	2812-04	2812-07	2812-10	2812-13	2818-01	2818-04	2818-07	2822-01
Lab ID (dist. metadata):	2807-14	2823-02	2812-05	2812-08	2812-11	2812-14	2818-02	2818-05	2818-08	2822-02
Date sampled:	1/12/90	12/03/90	12/03/90	12/03/90	12/03/90	12/03/90	12/04/90	12/04/90	12/04/90	12/05/90
WET CHEMISTRY (mg/L)										
Ammonia (NH3-N)	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Fluoride	0.258	0.276	0.293	0.31	0.419	0.383	0.1 U	0.105	0.1 U	0.1 U
Chemical Oxygen Demand	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.92	5 U	5 U
Chloride	11.8	6.08	5.87	8.82	10.3	10.8	0.1 U	1.22	0.1 U	1.28
Nitrite (NO2-N)	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Nitrate (NO3-N)	5.57 J	1.85 J	1.85 J	2.23 J	3.37 J	2.11 J	0.1 UJ	0.172 J	0.1 UJ	0.171 J
Bromide	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ortho-Phosphorus (PO4-P)	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Sulfate	35.3	18.1	18.3	24.3	35.6	35.1	0.1 U	8.27	0.1 U	0.1 U
Alkalinity (as mg/L CaCO3)	151	128	128	144	143	161	0.1 U	73	1.09	6.5
Conductivity (umhos/cm @ 25C)	424	314	311	360	397	425	0.85	163	1.12	18.8
Nitrate/Nitrite-N	---	---	---	---	---	---	---	---	---	---
Total Dissolved Solids	283	281	197	235	257	274	10 U	163	10 U	27.0
pH (s.u.)	7.47 J	7.31 J	7.40 J	7.45 J	7.52 J	7.57 J	7.55 J	7.85 J	8.31 J	8.48 J
Total Organic Carbon (TOC)	18	12 U	14 U	11 U	9.5 U	15 U	4.7 U	4.8 U	2 U	2 U
Total Organic Halides (TOH)	0.058 U	0.102 U	0.109 U	0.099 U	0.070 U	0.054 U	0.075 U	0.055 U	0.084 U	0.045 U